UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/829,360	04/09/2001	Thomas R. Giallorenzi	907.0014USU	9679

29683 7590 08/17/2005		EXAMINER
HARRINGTON & SMITH, LLP		SEFCHECK, GREGORY B
4 RESEARCH DRIVE		
SHELTON, CT 06484-6212	ART UNIT	PAPER NUMBER
	2662	

DATE MAILED: 08/17/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/829,360	GIALLORENZI ET AL.
	Examiner	Art Unit	
	Gregory B. Sefcheck	2662	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _19 May 2005_.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-13_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _1-13_ is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some *   c) ☐ None of:

      1. ☐ Certified copies of the priority documents have been received.

      2. ☐ Certified copies of the priority documents have been received in Application No. _____.

      3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

- Applicant's Amendment filed 5/19/2005 is acknowledged.

- Claims 1-13 remain pending.

Claim Rejections - 35 USC § 103

1.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

2.   Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gitlin

et al. (US005442625A), hereafter Gitlin, in view of Duran et al. (US006115608A),

hereafter Duran.

-    In regards to Claims 1, 2, and 4,

Gitlin discloses a CDMA system and method providing variable data rate access

to a user (Title).

Referring to Fig. 2, Gitlin discloses the system having a base station 290 and

mobile units 1-N. Each of those components of the system are provided with

transmitter 250 having multiple bonded transmitters and receivers capable of varying

code and frequency to achieve a variable bandwidth, variable rate multiple access

system (Col. 1, lines 6-10; Col. 3, lines 7-51; claim 1 – using a variable bandwidth

waveform with multiple bonded transmitters and receivers each agile in frequency and

code to provide a variable bandwidth and variable rate multiple access system; claim 4

– BS having transmitter for transmitting a waveform and plurality of frequency and code

agile modulators having output coupled to a radio channel; claim 4 – subscriber unit

comprising receiver for receiving the waveform from the radio channel and a plurality of

frequency and code agile demodulators).

Though CDMA inherently enables sharing of the spectrum, allowing

transmissions to overlap in both the time and frequency domain, Gitlin does not

explicitly disclose the system as a combination of CDMA and FDMA for improving the

concentration efficiency by making a larger pool of bandwidth available to each user.

Duran discloses systems in which properties of CDMA, FDMA and TDMA may

be combined to enhance particular operational characteristics of a system (Abstract;

claim 1,4 – defining system as combined CDMA and FDMA; claim 2 – use of CDMA

and FDMA provides improved concentration efficiency by making a larger pool of

bandwidth available to each user).

It would have been obvious to one of ordinary skill in the art at the time of the

invention to modify the system and method of Gitlin by combining the advantages of the

CDMA and FDMA, as shown by Duran, in order to handle more communication

channels at the same time (Duran; Col. 3, lines 38-41).

- In regards to Claim 3,

Gitlin discloses a CDMA system and method providing variable data rate access that covers all limitations of the parent claim.

Gitlin discloses that the system enables variable and dynamic bandwidth capacity access at variable rates (Title; Col. 1, lines 6-10 and 40-42; Col. 3, lines 30-41; claim 3 – channel bonding across code space and frequency space enables system to operate in at least one of a variable, contiguous or non-contiguous bandwidth at a finely variable rate).

- In regards to Claims 5 and 6,

Gitlin discloses a CDMA system providing variable data rate access that covers all limitations of the parent claim.

Gitlin discloses that system operates at a plurality of rates, from the basic rate to a multiple M of the basic rate, to a maximum rate Mmax, where M is an integer of at least 1 (Abstract; Col. 3, lines 18-21; claim 5 – N mods and N demods operable for communicating at data rates that are power of two multiples of a basic rate on a plurality of frequency subchannels within a channel; claim 6 - N mods and N demods operable for communicating at data rates that are power of two multiples of a basic rate from minimum rate to maximum rate at a granularity that is an integer multiple of the basic rate).

- In regards to Claim 7,

Gitlin discloses a CDMA system providing variable data rate access that covers all limitations of the parent claim.

Gitlin shows that N (X) mobile users may communicate with the base station using the finite frequency bandwidth Z of the system distributed through carrier frequencies Y in a variable and dynamic manner, thereby utilizing system capacity optimally and efficiently (Fig. 6; Abstract; Col. 7, lines 37-44; claim 7 – statistical concentration is achieved when the system has Y Mbps of aggregate capacity allocatable to X users simultaneously at rates Y/X Mbps each and by tuning mods/demods to any one of Z frequency subchannels, the useable bandwidth is Z times the Y Mbps bandwidth of any one channel and Z*X users are supported simultaneously at rates of Y/X Mbps).

- In regards to Claim 8,

Gitlin discloses a CDMA system providing variable data rate access that covers all limitations of the parent claim.

Gitlin shows that a user may utilize multiple basic rate streams for transmission to the base station over the same radio channel (Abstract; Col. 3, lines 7-41). The maximum number of multiple basic rate streams would inherently be limited to the size of the radio channel (claim 8 – bandwidth of any one subchannel is X MHz, at least some of the mods/demods are tuned to different ones of contiguous or non-contiguous X MHz sub-channels within a Y MHz channel, where Y > X).

-   In regards to Claim 9,

Gitlin discloses a CDMA system providing variable data rate access that covers

all limitations of the parent claim.

Though Gitlin does not explicitly disclose the use of 3.5 MHz sub-channels in a

14 MHz channel, the allocation of bandwidth in the system is shown to be dynamic and

variable based on the specific requirements of the system users (claim 9 – X = 3.5 and

Y = 14).

It would have been obvious to one of ordinary skill in the art at the time of the

rejection to utilize sub-channel and channel rates that best utilize the data-carrying

capacity of the system, as shown by Gatlin, based on the changing requirements of the

system users.

3.   Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Gitlin in view of Duran as applied to claim 4 above, and further in view of Cupo et al.

(US006603826B1), hereafter Cupo.

-   In regards to Claims 10-12,

Gitlin discloses a CDMA system providing variable data rate access that covers

all limitations of the parent claim.

Gitlin does not explicitly disclose the use of a punctured convolutional code to

increase the rate while adapting to mitigate fading.

Cupo discloses the use of a controlled punctured convolutional code for selectively increasing the coding rate, for example from 2/5 to 1/2, while preserving immunity to fading (Col. 5, lines 52-62; Col. 7, lines 54-57). Similarly, other aspects of the convolutional coding, such as constraint length, could be varied to achieve performance dictated by the system/user requirements (claim 10 – input data to mods is punctured convolutional code; claim 11 – input data to mods is ½ rate, constraint length 7 code that is punctured to increase the rate; claim 12 – puncturing rate is made adaptive to mitigate fading conditions).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Gitlin by utilizing a controlled punctured convolutional code, as shown by Cupo. The use of a punctured convolutional code would enable the code rate to be increased while preserving immunity to fading on the system channels.

4.   Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gitlin in view of Duran and Cupo as applied to claim 11 above, and further in view of Shalvi et al. (US 20050174978A1), hereafter Shalvi.

        -    In regards to Claim 13,

Gitlin discloses a CDMA system providing variable data rate access that covers all limitations of the parent claim.

Referring to Fig. 2, Gitlin shows that the outputs of Walsh 203/223/243 and spreading 204/224/244 modulators are coupled to the radio channel through quadrature coders using a cosine operation in order to communicate with the proper base station.

Gitlin does not explicitly show the use of an end to end raised-cosine Nyquist pulse shape filter between the modulators and the radio channel.

Shalvi discloses a CDMA system in which a raised-cosine Nyquist pulse shape filter is coupled between the modulator and the radio channel of a transmitter (Fig. 1; Pg. 1, paragraph 12; claim 13 – output of mods is coupled to radio channel through an end-to-end raised-cosine Nyquist pulse shape filter).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the system of Gitlin by utilizing a raised-cosine Nyquist pulse shape filter between the modulators and the radio channel, as shown by Shalvi, in order to alleviate inter-symbol interference between the sources.

Response to Arguments

5.   Applicant's arguments with respect to claims 1-13 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

6.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- Trott et al. (US006684366B1) discloses a multi-rate codec with puncture control
- Gitlin et al. (US005856971A) discloses a code division multiple access system providing variable data rate access to a user

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory B. Sefcheck whose telephone number is 571-272-3098. The examiner can normally be reached on Monday-Friday, 8:00am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou can be reached on 571-272-3088. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GBS
8-12-2005

JOHN PEZZLO
PRIMARY EXAMINER